

Claims

[30020369 US]

1. Apparatus for accelerating assessment of an optical transmission system using Bit Error Rate (BER) tests, the apparatus comprising a controllable laser transmitter and a data generator coupled to the controllable laser transmitter for modulating the light output of the laser transmitter with test transmission data, the controllable laser transmitter having an output coupled to an optical transmission system to be assessed, a BER measurement unit coupled to an output of the optical transmission system, a processing unit coupled to the BER measurement unit and to a laser controller coupled to the controllable laser transmitter for adjusting the extinction ratio of the controllable laser transmitter to provide relatively high test BER values at the BER measurement unit, the processing unit including a calculator for calculating a Q-factor for at least two different values of the extinction ratio from the relatively high measured test BER values and for obtaining a Q-factor value by extrapolation therefrom for an extinction ratio of the controllable laser transmitter in normal operation thereby enabling the BER to be calculated for normal operation of the controllable laser transmitter.
2. Apparatus according to claim 1, wherein the data generator is a Pseudo Random Bit Sequence (PRBS) generator.
3. Apparatus according to claim 1, wherein the controllable laser transmitter comprises an electrically and directly modulated laser diode which outputs a digital light signal, the light output of the laser diode being modulated by the test transmission data.
4. Apparatus according to claim 1, wherein the optical transmission system includes a forward error correct (FEC) element.
5. Apparatus according to claim 4, wherein the laser controller comprises a continuous controller for continuously adjusting the extinction ratio of the controllable laser transmitter to provide a second relatively high test BER value

substantially different to a first relatively high test BER value at the BER measurement unit.

6. A method for accelerating assessment of an optical transmission system using Bit Error Rate (BER) tests, the method comprising the steps of:
  - generating test data for modulating light output of a laser transmitter;
  - outputting light from the laser transmitter modulated by the test data;
  - receiving the modulated light via an optical transmission system;
  - measuring the BER for the received light;
- 10 adjusting an extinction ratio of the laser transmitter to produce relatively high measured BER values;
- 15 calculating a Q-factor for at least two different values of the extinction ratio from the measured BER values;
- obtaining a Q-factor by extrapolation therefrom for an extinction ratio of the laser transmitter in normal operation; and
- 20 calculating the BER for normal operation of the laser transmitter.

7. A method according to claim 6, wherein the step of generating data comprises generating Pseudo Random Bit Sequence (PRBS) data.
- 25 8. A method according to claim 6, wherein the step of outputting light from the laser transmitter comprises modulating the light output of a laser diode of the laser transmitter to provide a digital output light signal.
9. A method according to claim 6, further comprising the step of forward error correction (FEC) in the optical transmission system prior to measurement of BER values.
10. A method according to claim 9, wherein the step of adjusting an extinction ratio of the laser transmitter comprises continuously adjusting the extinction ratio of the laser transmitter to provide a second relatively high test BER value substantially different to a first relatively high test BER value.